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ABSTRACT

Ten developmentally delayed children and adolescents participated in a rapid method toilet training program. Ss' success in the program was correlated with 11 variables recorded prior to the inception of the program. Response to simple commmands, assaultiveness, destructiveness and social age were found to correlate positively with toileting success while nonviolent self stimulation was negatively correlated with success. (Author/CL)

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NEW YORK STATE DEPARTMENT OF MENTAL RETARDATION

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BROOME DEVELOPMENTAL CENTER

DEPARTMENT OF PSYCHOLOGY

TECHNICAL REPORT No. 78-02

VARIABLES THAT PREDICT SUCCESS IN THE ACQUISITION OF TOILETING SKILLS

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ABSTRACT

Ten developmentally disabled subjects were enrolled into a rapid method toilet training program. Their success in the program was correlated with descriptive variables that were recorded prior to inception of the program. It was found that response to simple commands, assaultiveness, destructiveness and social age correlated positively with toileting success. Non-violent, self-stimulation was negatively correlated with success. Early in training, the ratio of self-initiated eliminations to toileting accidents correlated highly with later outcome success. Other variables that are commonly found in the literature to describe subjects do not appear to be instrumental in predicting success in toilet training programs.

Variables that Predict Success in Toileting Skill Acquisition

Facilities which serve the mentally retarded recognize the importance of toilet training their clients. The incontinent client is typically excluded from many habilitative programs, including training workshops and special education classes. The soiled client socially is unappealing and typically receives less attention from institutional staff. In addition, the incontinent client is expensive to maintain in an institutional setting because of the materials and staff time that go into custodial care. An effective toileting program can have an exponential impact on the amount of habilitation that a client receives.

One major decision that confronts the therapist prior to training is the selection of candidates to be enrolled into the program. Subjects who do not possess the prerequisite skills for training ultimately fail in the program. Such failures delay the training of other individuals, are wasteful of time, and are demoralizing to staff. Consequently, there is a need for an effective screening procedure to evaluate a client's potential for attaining self-sufficiency in toileting.

Several authors have published the results of toilet training programs that they have systematically carried out (See Table I). The statistics reported in these studies that describe the subjects are not readily comparable with one another and typically are not helpful in isolating the characteristics that will predict successful toileting behavior. There are several reasons for this. First, there is no uniformity among investigators in the variables selected to describe their subjects. Some authors use I.Q.'s while others report social ages. Secondly, authors may report the same descriptor differently.

To illustrate, chronological age is reported as a group mean by one author and as a range by another. Similarly, authors use different tests to measure intelligence. A third reason why the results are not comparable among studies is the statistics used for reporting group results. A study may report, for example, a 60% success rate. This could be interpreted to mean that 60% of the individuals were trained, or, that there were 60% fewer toileting accidents, or, a reduction in soiled laundry by 60%. For these reasons it is difficult to compare the results from different studies. There is a need among researchers to be consistent with one another in selecting their descriptive measures (Grosek, 1977).

INSERT TABLE I ABOUT HERE

In the present study, descriptive and behavioral characteristics of subjects participating in a modified Foxx-Azrin toilet training program were recorded. The outcome data (success vs. failure) were correlated with both pretraining data and with progress measures recorded during the training. It was planned that these data would assist clinical staff in setting cut-off points to select candidates who could be toilet trained.

METHOD

Subjects - Ten residents of Broome Developmental Center were selected from the children's and adolescents' units. All subjects were ambulatory and appeared to have adequate vision and hearing. None of the subjects had any major physical or medical problems. These were the guidelines that governed client admission into the program. They were intentionally lax, so as to allow residents functioning at a variety of behavior levels to participate in the program.

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Table II presents a descriptive profile of the ten subjects. Information on mental ages and intelligence quotients were not included because most of the clients were not testable. Under "seizures", a "yes" response indicated that the subject had had a seizure in the past year or that he was currently on anti-convulsant medication. Problem behaviors directed against others included both verbal and physical assaultiveness. For the category "Response to Commands", the subject reliably (three times in succession) completed all three commands to "sit", "stand", and to "come here". Information to complete the Vineland Social Maturity Scale, the Cain Levine Scale, and a problem behavior checklist was collected from an institutional staff member on the ward who worked most closely with each client.

INSERT TABLE II ABOUT HERE

Apparatus - The wet pants alarm and the potty alert wire were used to facilitate the detection of voiding. Both of these devices are described elsewhere (Azrin, Bugle, and O'brien, 1971).

Procedure - A rapid method of toilet training was implemented. The reader is referred to Foxx and Azrin (1973-B) for a complete description of this program. Briefly, the program can be conceptualized into three distinct phases. In the first phase, each subject was given a large amount of fluid followed by prompts (as needed) to approach the toilet. If he voided, he was reinforced. If he did not, he was returned to a nearby chair. At the end of 30 minutes, the next discrete trial began. The second phase began when the subject self-initiated his first trip to the toilet without any assistance by the therapist. He remained in the training setting and practiced the toileting response. With each self-initiation the subject was moved further away from the toilet. Also, distractors were introduced. The subject had

access to toys, wore a complete set of clothes, and participated in other programs (i.e., a dressing program).

In the third phase, the subject returned to his home ward to practice his new skill. This was called the maintenance phase. He was gradually allowed to return to off-ward program activities after steps were taken to generalize the toileting response to other parts of the facility. A subject was considered successfully trained if he (she) did not have any toileting accidents for 14 consecutive days.

Three modifications were made to the Foxx-Azrin (1973) technique. Before graduating to the third phase of training (return to the unit) the subject was required to perform nine self-initiations followed by three days without an accident. Secondly, during this same practice phase, the subject was required to self-initiate at least one bowel movement. For the third modification, the recommended 30 minutes overcorrection was reduced to 10 minutes.

Program Interruption - The toileting study ended prematurely after the tenth subject completed the program. Staff from the training program were then reassigned to other parts of the facility to help alleviate a staff shortage problem created by new resident admissions.

RESULTS

The data are summarized in Table III. Based on their performance, the subjects were classified as follows:

Successful - remained continent for two weeks after returning to the ward (n = 2).

Partially Successful - subjects in this category completed all the

milestones in the program except the last one, which was to remain continent for two weeks on the ward. By the end of the program, two candidates averaged three or four self-initiations and one accident each day while on the ward. This represents a reduction of (at least) 75% in toileting accidents. The third subject averaged two or three self-initiations each day and one accident every three days while on the ward. Prior to the inception of the toileting program, this subject was taken to the bathroom approximately three to four times every day (n = 3).

Failure - these subjects either (a) failed to self-initiate after being in the program for ten days, or (b) failed to remain continent for three days following the nine self-initiations (n = 5).

Table IV presents the correlations between the performance outcomes with the population statistics (Table II) and the program data (Table III).

INSERT TABLES III AND IV ABOUT HERE

DISCUSSION

Among the variables, the best predictors of skill acquisition of toileting behavior appear to be "response to simple commands" and the presence of problem behaviors. The relationship of receptive language to acquiring a new skill is fairly straight forward. Throughout the training program the subject is called upon to respond to commands. The responses to "stand" and to "sit" are actual steps in the program. The relationship of toileting success to problem behaviors is less obvious. The data suggests that individuals who attend to the environment (albeit inappropriately) are more likely to learn toileting skills. Engaging in assaultiveness and destructiveness is an indication that the subject attends to relevant stimuli in his environment. On the other hand, those

individuals who attend primarily to themselves, as evidenced by non-violent self-stimulation, tended not to acquire toileting skills. It would be interesting to investigate the relationship of other variables that indicate an awareness of the environment, such as playing with toys, watching television, and playing with other children with the acquisition of toileting skills.

Scores on the functional behavior scales (Vineland and the Cain-Levine) did not correlate highly with successful toileting behavior. This result is unexpected. Perhaps we can account for these low correlations by the fact that we have selected scores from a restricted range of individuals. In a general population, the correlations would be much higher.

From Table II it appears that the successful and partially successful candidates have certain characteristics in common. Eighty percent of these candidates had a social age of 1.70 or higher, were assaultive toward other people, and/or did not engage in non-violent self-stimulatory behavior. All of the successful or partially successful candidates were able to complete three simple commands. None of the other variables in Table II appear to predict toileting success.

Table III presents data that was recorded during the early phases of the program. Part A summarizes the data during training prior to the subject's first self-initiation. Part B presents program data from the period following the first self-initiation to the beginning of the maintenance phase (at which time the subject returned to his home ward.) Correlations between these data and the final performance outcome are presented in Table IV, Part B. Prior to the first self-initiation, there do not appear to be any strong predictors of success among the program training data. However, following the first self-initiation, the ratio of self-initiation to toileting accidents correlates

highly (.72) with final outcome performance. This ratio is important. Many non-successful subjects initiated frequently, while simultaneously having several toileting accidents. From the raw data (which is not presented here) this ratio began high (75) and remained high throughout training in the successful candidate. In other candidates, this ratio was generally less than one.

Many of the correlations in this study are low and not statistically significant. The small sample size makes it untenable to generalize these results beyond this study. Nevertheless, this study indicates that there are subject variables that are readily available to clinical staff that could be helpful in predicting success in toilet training. To achieve this goal, other therapists are encouraged to record and to publish population statistics that are consistent with those that other investigators are using in their toileting programs. Such a pooling of subject and program data may enable therapists to set statistically-based criteria for determining which subjects have the best chance for attaining self-sufficiency in toileting.

TABLE I

TOILET TRAINING STUDIES

Authors	Year	#Ss	C.A.[1]	S.A.[1]	IQ	Inst.[2]	% Success	Time To Criteria[3]
Arslanian et al	1972	48	9.08	1.16	--	--	--	14M
Baumerster, Klosowski	1965	11	17.92	--	13	--	60	--
Bensberg et al	1965	7	7-15	1.3	--	--	72	8M
Edgar et al	1975	10	4-12	--	--	--	80	--
Foxx, Azrin	1973(A)	9	43	--	14	21	100	6D
Giles, Wolf	1966	5	10.22	1.8	--	--	100	62D
Hundziak et al	1965	8	7-14	--	--	--	--	27D
Kimball et al	1967	40	5-18	--	--	--	--	7M
Mahoney et al	1971	5	5	--	10-14	--	80	29H
Spencer et al	1968	38	8.5	--	--	1.33	--	6W
VanWagener et al	1969	9	6.33	--	--	--	100	20D

[1] Years

[2] Length of institutionalization in years

[3] H=Hours, D=Days, W=Weeks, M=Months

TABLE II

SELECTED SUBJECT CHARACTERISTICS

	C.A.*	S.A.	S.Q.	C-L	INST.	SZ.	PB-P	PB-O	S.I.B.	SS	RC
S_1	11.40	1.79	16	64	66	Y	Y	N	N	N	Y
S_2	8.75	2.20	25	59	35	N	Y	Y	Y	Y	Y
S_3	10.50	1.06	10	46	2	Y	N	N	N	Y	N
S_4	19.83	1.59	8	56	157	N	N	N	N	Y	N
S_5	16.00	1.89	12	55	137	N	Y	Y	N	Y	Y
S_6	11.33	1.94	17	58	90	N	Y	Y	Y	N	Y
S_7	13.53	1.65	12	53	71	N	N	N	Y	Y	Y
S_8	18.92	1.53	9	49	39	N	N	N	Y	N	Y
S_9	6.33	1.41	22	48	15	Y	N	N	N	Y	N
S_{10}	10.50	2.20	21	60	13	N	Y	Y	Y	Y	N
Mean	12.71	1.73	15.20	54.8	62.5						

* The column headings represent Chronological Age, Social Age and Social Quotient (Vineland Social Maturity Scale), Cain-Levine (total score), length of Institutionalization (months), presence of Seizures and Problem Behaviors directed toward other people (PB-P), Objects (PB-O), Self-injurious Behavior (SIB), non-violent self-stimulation (SS), and response to simple commands (RC).

TABLE III

RESULTS OF THE TOILETING PROGRAM

A. Prior to the First Self-Initiation

	Ratio of Voids to Trials	Ratio of Accidents to Trials	# Days to the First Self-Initiation
S_1	.83	0	1
S_2	.88	0	2
S_3	.87	.20	--*
S_4	.75	.13	2
S_5	1.00	0	1
S_6	.76	.21	5
S_7	.80	0	1
S_8	.50	0	1
S_9	.57	.16	--*
S_{10}	.80	.07	--*

B. Following First Self-Initiation and Prior to Maintenance on the Ward

	Self-Initiations	Accidents	Ratio of Self-Initiations to Accidents	# Days to Return to Unit	Disposition
S_1	9	14	.64	6	Partial Success
S_2	29	5	5.80	12	Success
S_3	--*	--	--	--	Failure
S_4	19	22	.86	--	Failure
S_5	59	8	7.37	9	Success
S_6	83	17	4.88	8	Partial Success
S_7	11	4	2.75	--	Failure
S_8	13	2	6.50	8	Partial Success
S_9	--*	--	--	--	Failure
S_{10}	--*	--	--	--	Failure

* No Self-Initiations

TABLE IV

CORRELATION OF SELECTED SUBJECT CHARACTERISTICS

WITH SUCCESS IN TOILETING

A. Subject Characteristics	Correlation with Success
Response to Commands	.73**
Problem Behavior - People	.64*
Problem Behavior - Objects	.57
Problem Behavior - Self-stimulation	-.57
Social Age (Vineland)	.52
Cain-Levine Score	.36
Seizures	.31
Length of Institutionalization	.26
Social Quotient (Vineland)	.21
Chronological Age	.16
Problem Behavior - Self-injurious Behavior	.13

B. Program Data	Correlation with Success
I. Prior to the first self-initiation	
Ratio of voids to trials	.38
Ratio of accidents to trials	.50
No. of days to first self-initiation[1]	0
II. Following the first self-initiation	
No. of self-initiations[1]	.42
No. of accidents[1]	-.35
Ratio of self-initiations to accidents[1]	.72**

* P .05

** P .01

[1] based on 7 subjects

C. Subscale Scores	Correlation with Success
I. Vineland Social Maturity Subscale	
Communicator	.56
Self-help; dressing	.53
Occupation	.47
Locomotion	.40
Self-help; general;	.36
Self-help; eating	.32
Socialization	.08
^{2}s	---
II. Cain-Levin Subscale	
Initiation	.31
Social Skills	.31
Communication	.30
Self-help skills	.20

[2] All subjects scored zero

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